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SEALED IN GLASS



DOMINION GLASS COMPANY LIMITED

Pour obtenir la version française de cette brochure, il suffit d'écrire au Directeur des relations publiques, Dominion Glass Company Limited, 1080 Côte Beaver Hall, Montréal 128, Québec.



Introduction

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Dominion Glass Company Limited, a Canadian company with headquarters in Montreal, is the largest supplier of glass containers, tumblers and tableware in Canada. The company's history dates back to 1913 in its present form and to 1855 in predecessor companies.

The company operates six glass container manufacturing plants in Canada located in Montreal, Quebec; Bramalea, Hamilton and Wallaceburg, Ontario; Redcliff, Alberta and Burnaby, British Columbia. A plant in Etobicoke, Ontario manufactures plastic containers and a subsidiary, National Pressed Glass of Brantford, Ontario supplies industrial glass products to major manufacturing companies in Canada and the United States.

Dominion Glass serves some 850 customers in the food processing, distilling, brewing, wine, soft drink, cosmetic, pharmaceutical and chemical industries as well as supplying tumblers and tableware to the retail and institutional trades.

A \$40 million expansion and modernization program undertaken since 1968 has reshaped company facilities at all locations. Production capacity has been doubled at Burnaby and a new plant at Bramalea, Ontario, the most modern of its kind in North America, was completed in September, 1970.

The \$20 million Bramalea plant, on the outskirts of Toronto was designed for easy expansion from the present two furnaces and eight production lines to three furnaces and 12 production lines. With the most up-to-date machinery and equipment available, the Bramalea plant boasts many 'firsts', among them the first 'triple-gob' bottle making machines in Canada.

Modern facilities, modern organization and effective customer service are the reasons why Dominion Glass maintains its leadership in the Canadian glass container industry.



1 - The batch building.

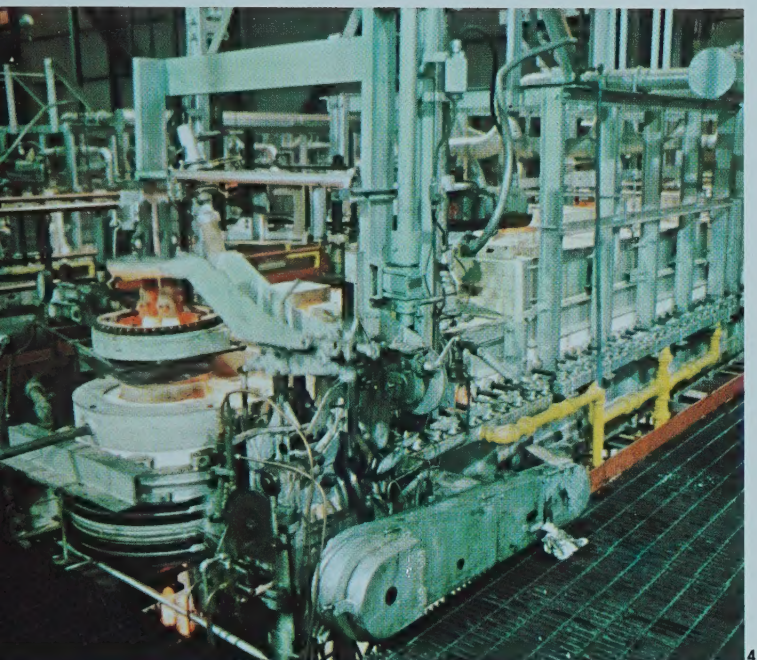
2 - Raw materials.

3 - Operations at all stages of production are rigidly controlled to provide the best quality product.

4 - Molten glass flows from the furnace through the feeder channels and into the gob feeder.

5 - Inside the furnace — molten glass at 2800° F.



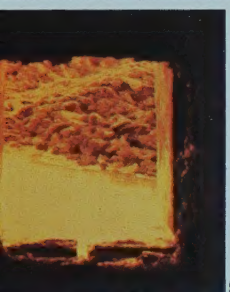


Container design

The production of a new glass container begins with the design. The company's design development group prepares sketches for the customer's approval and when all details of shape, size, weight and decoration have been settled, a mock-up of the jar or bottle is made in wood or plastic. Engineering drawings are prepared from which the moulds are made.

Raw materials

Clear, or flint bottle glass is made from sand (almost pure silica), soda ash (sodium carbonate), and limestone (either as calcium carbonate or calcium magnesium carbonate) which gives the glass hardness and chemical durability. 'Cullet', or crushed waste glass, is added to the raw materials batch to speed up the melting process. Small quantities of oxides of chromium, cobalt, iron, nickel, carbon and sulfide or sulphur are added to the batch to make coloured glass.



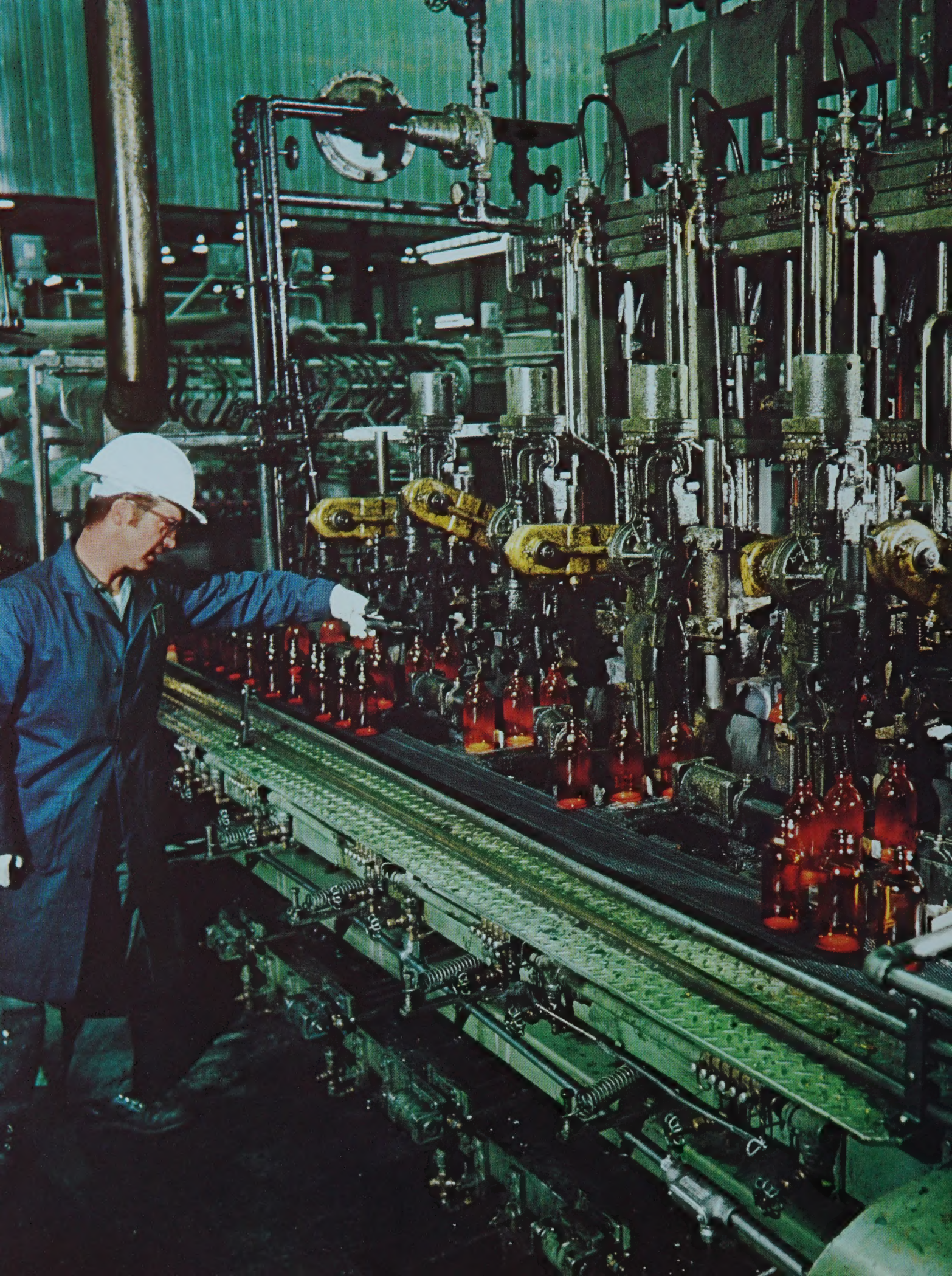
An important factor in the strong position of glass in the packaging industry is the basic economy of these raw materials which are plentiful, readily available and relatively low cost. Dominion Glass normally produces containers in flint (clear), amber, emerald green and royal blue.

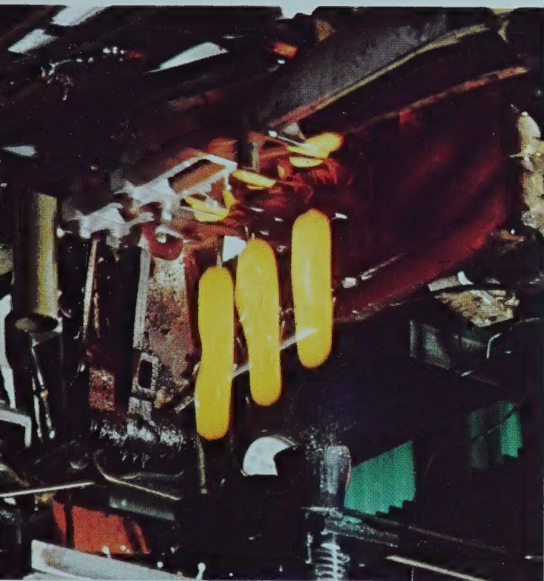
In a completely automated operation, raw materials are unloaded into storage compartments in a 'batch' building at one end of the plant where they are mixed in precise quantities in 'batches' weighing two to three tons. The raw materials are fed into the furnace in a steady stream through an automatic charging device.

The furnace

The furnace is the heart of the glass container manufacturing process. The glass 'tanks', as the furnaces are often called, are lined with special fire resistant refractory brick.

Cross-fired by gas from above the surface of the molten glass, the inside of the melting chamber is a white hot inferno with temperatures reaching as high as 2800 degrees Fahrenheit. Electronic instruments control the firing and operation of the furnaces.





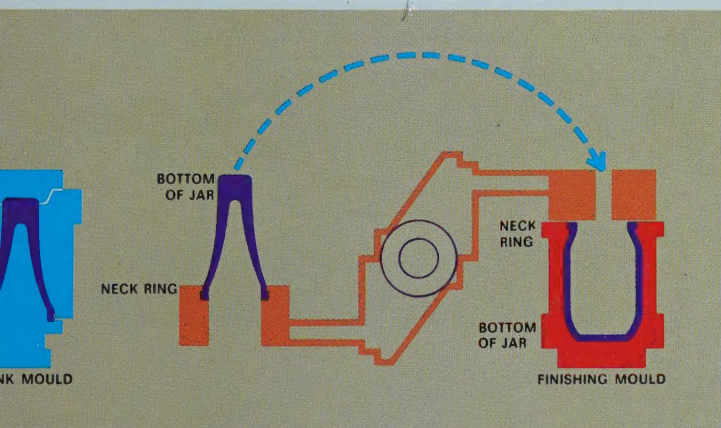
As the raw materials enter the melting chamber they immediately begin to melt, forming seething masses similar to ocean currents. The bubbling mass flows in a steady stream toward a narrow throat at the far end of the melting chamber into the refining chamber.

The Forming Machines

From the refiner the glass flows into the feeder channels, then through a ceramic orifice ring where it is sheared off into 'gobs'. Each gob contains exactly the right amount and shape of glass to make the style of container being run. The gob slides down a chute into the blank mould.

A plunger or puff of air forms the glass into the semblance of a bottle — smaller than the final bottle and in an inverted position. The gob has now become a preformed "parison".

The blank mould opens and the embryo bottle (parison) is transferred in a 180-degree arc into the 'finishing mould' where compressed air blows it into final shape.



In a fraction of a second the iron jaws of the two-piece finishing mould swing open and a finished container appears, and then another, and another — all exactly alike. Skilled machine operators constantly check the many variables of this intricate machine to ensure proper and exact distribution of glass in the mould.

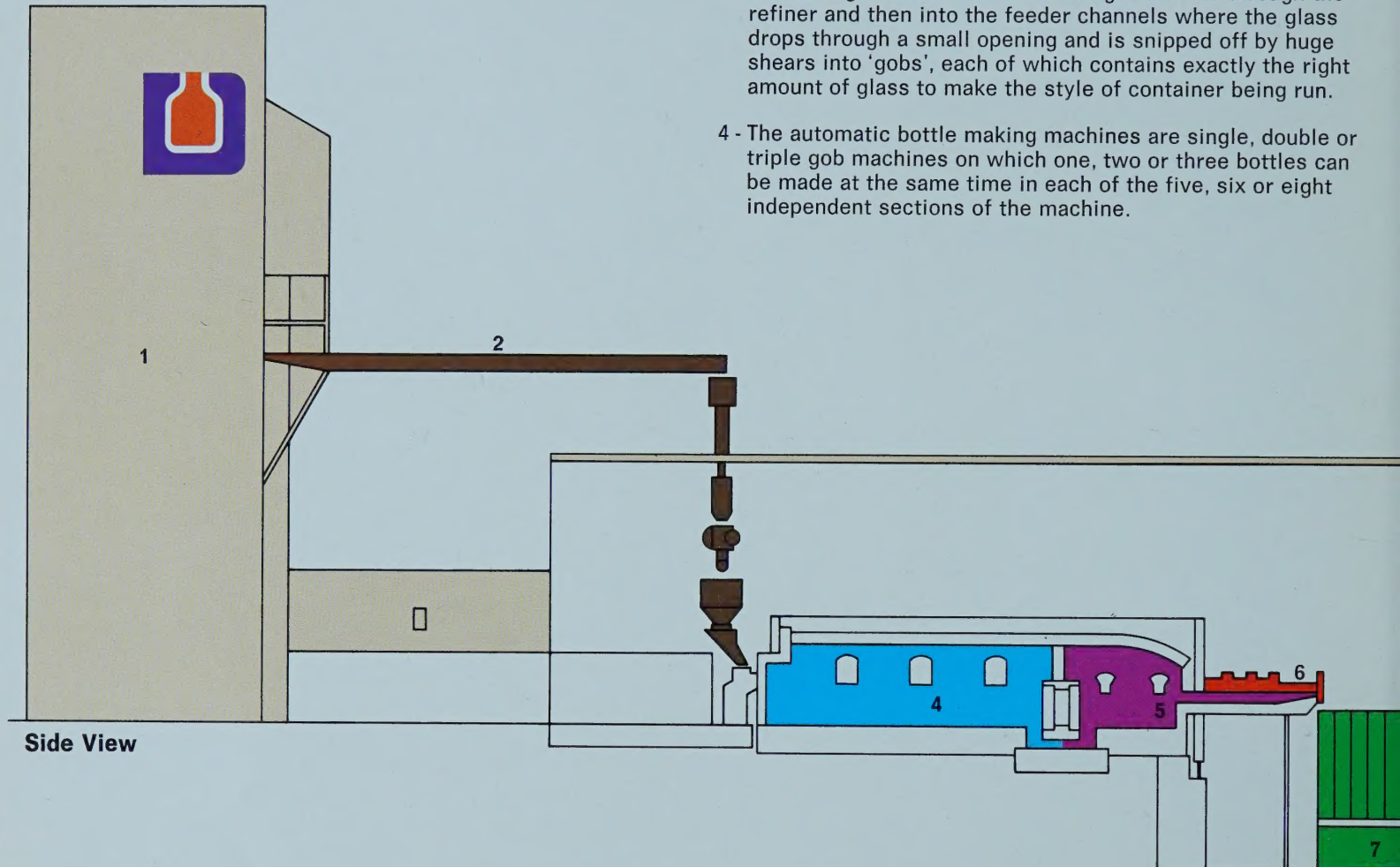
In continuous succession the precisely timed steel fingers of the take-out arm gently grasp the neck or 'finish' of the bottle, swinging it onto a conveyor belt where it joins other identical bottles released in turn from other identical sections of the huge automatic machine.



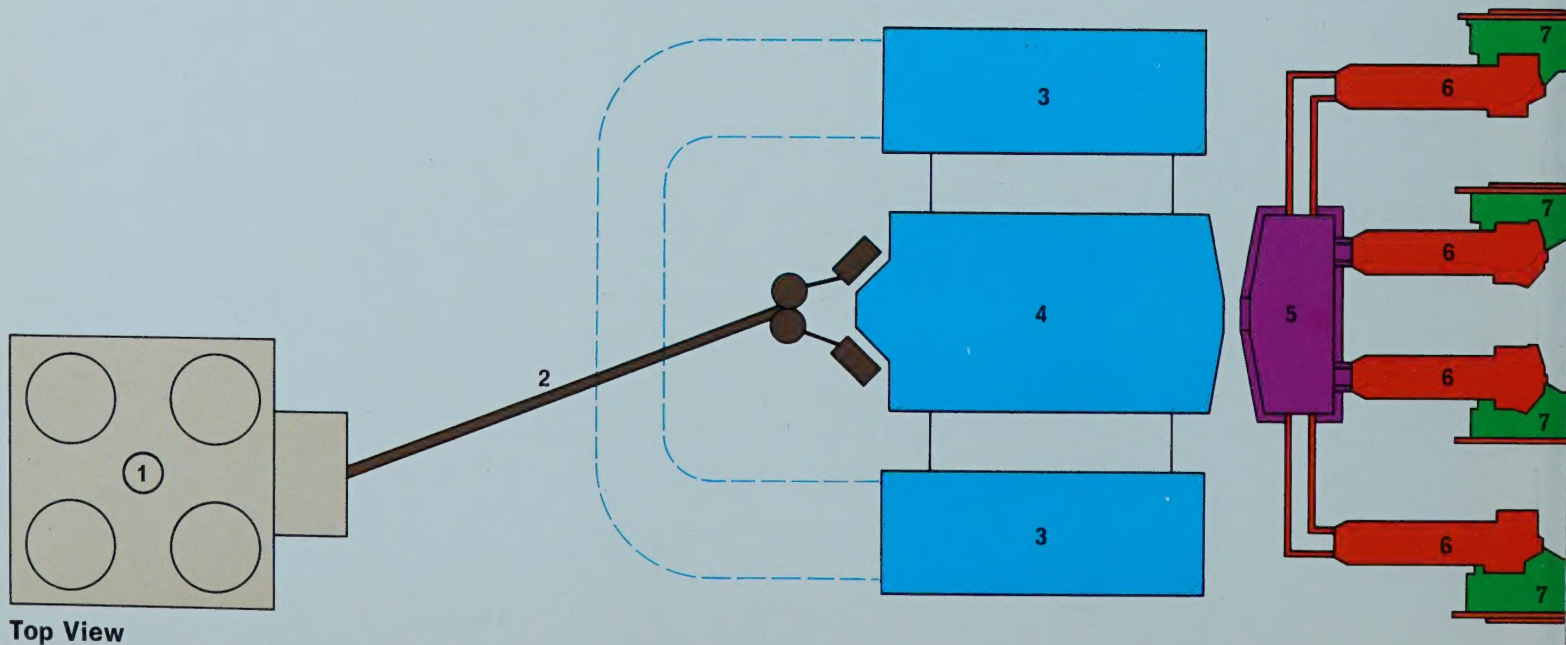
Slowly, for an hour or more under strict controls, the new containers travel through the 'lehr' — a long tunnel-like oven which reheats and tempers them while gradually being cooled from 1000 degrees down to room temperature.

Glass container manufacturing process

- 1 - The 'batch' plant where raw materials are stored and mixed with computer-controlled precision before being fed into the furnace. The batch building is the most prominent feature of a glass container manufacturing plant and is often a landmark in the area.
- 2 - The furnace, standing about four storeys in height, is some 70 feet long and 60 feet wide. The melting chamber of the furnace can hold over 400 tons at a time and operates at temperatures up to 2800 degrees Fahrenheit.
- 3 - On leaving the furnace the molten glass flows through the refiner and then into the feeder channels where the glass drops through a small opening and is snipped off by huge shears into 'gobs', each of which contains exactly the right amount of glass to make the style of container being run.
- 4 - The automatic bottle making machines are single, double or triple gob machines on which one, two or three bottles can be made at the same time in each of the five, six or eight independent sections of the machine.



Side View



Top View

5 - The annealing oven, or 'lehr' is a long tunnel-like structure through which the bottles or jars pass on a wide conveyor belt. Temperature of the lehr at the hot end is 1000 degrees Fahrenheit. The containers are reheated and tempered during the hour-or-so they are in the lehr under strictly controlled heat conditions until at the cold end they can be handled without gloves.

6 - As the bottles leave the lehr they are sprayed with a protective coating to guard them against scratches and abrasions in shipping and handling.

7 - Automatic inspection machines electronically check top and bottom sections of each container and if not perfect, the container is immediately ejected off the conveyor line. Under a rigid statistical quality control program, containers are subjected to further tests in the plant laboratory including polaroscopic analysis, simulated filling-line stress tests, hydrostatic pressure and thermal shock tests, and capacity tests by volume comparator.

8 - All containers are given a final individual visual inspection before being packed for storage or shipment.

1 - Batch Plant

2 - Holding Hoppers

3 - Regenerators

4 - Furnace

5 - Refiner

6 - Feeder channels

7 - Bottle making machines

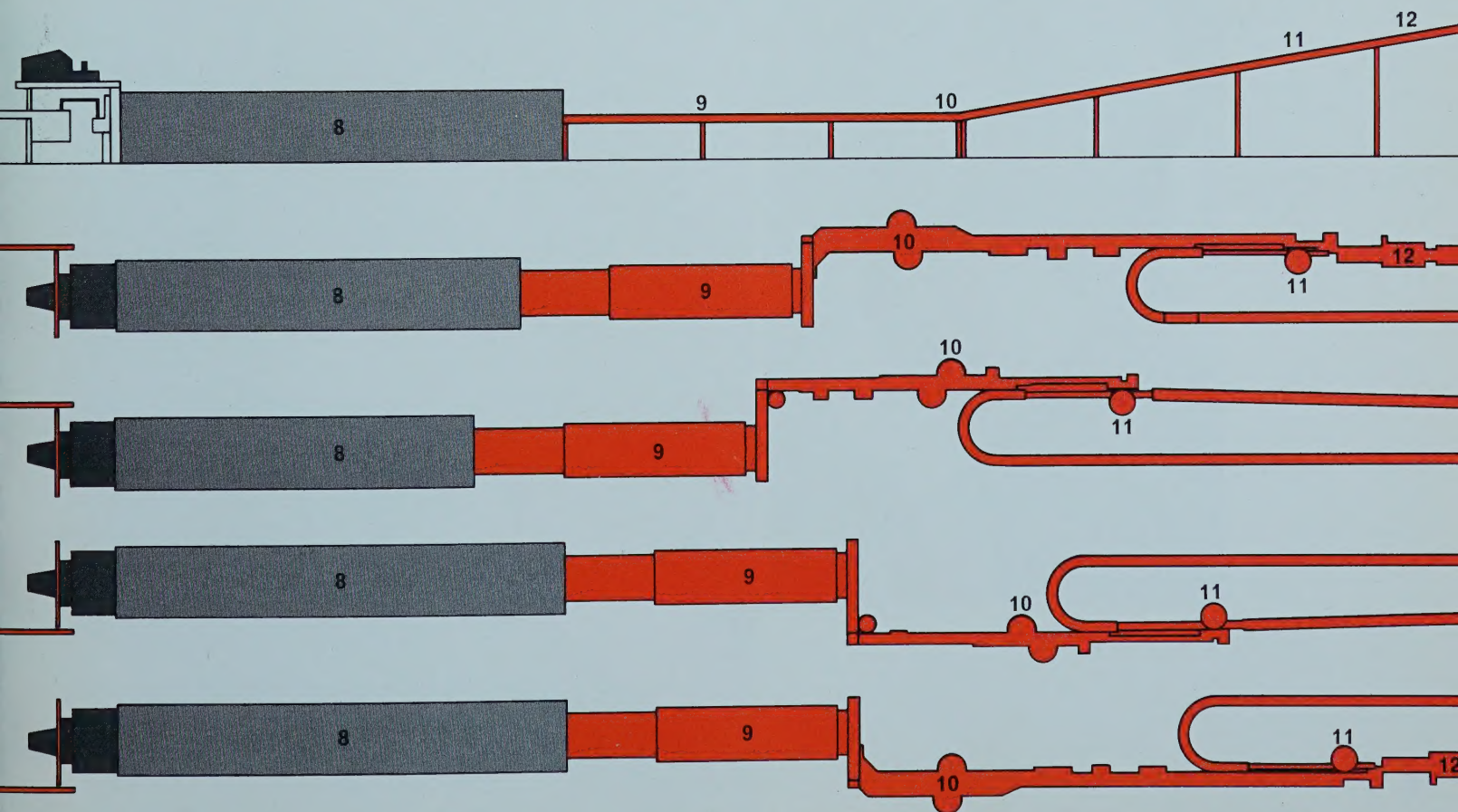
8 - Lehrs

9 - Conveyor systems

10 - Automatic inspection equipment

11 - Final visual inspection

12 - Packing



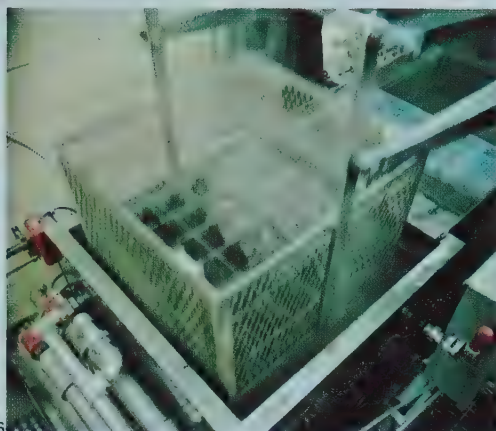




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- 1 - A surface coat, sprayed directly onto containers as they leave the annealing oven protects them from scratches and abrasions during handling and shipping.
- 2 - Automated inspection machines electronically check top and bottom sections of each container. If not perfect, the container is instantly ejected off the conveyor line.
- 3 - Sophisticated equipment such as this volume comparator, is used to check container capacity.
- 4 - Polaroscopic analysis ensures that no imperfections have survived the rigid testing processes.
- 5 - Hydrostatic pressure tests to hundreds of pounds per square inch guarantee more than merely adequate strength.
- 6 - Containers are subjected to a variety of stresses on this simulated filling line.
- 7 - Thermal shock tests in which the containers are subjected to alternate heat and cold under controlled laboratory conditions, check container resistance
- 8-9 - After all this rigorous testing, a final visual inspection, before automatic packing machines prepare the containers for shipment.
- 10 - Proper warehousing, inventory control and delivery scheduling are geared to customer needs and deadlines. Finished containers leave Dominion Glass warehouses by rail and truck for delivery to thousands of plants where they are filled, capped and labelled.



As a packaging material, glass possesses qualities unequalled by any other material. Glass containers are used in packaging thousands of products — foods, beers, liquors, wines, soft drinks, cosmetics, toiletries, pharmaceuticals and chemicals.

Glass containers are transparent, so that the consumer can see what he is buying; they can be made in a variety of colours — amber, emerald green and royal blue when necessary to protect the contents from light or from the sun's rays.

Glass containers are light, but strong and durable. They can withstand temperature changes, resist pressure and corrosion. They can be resealed. Glass is non-porous so that well-sealed bottles are airtight and moisture proof allowing their contents to be stored over long periods of time. Glass is odourless and does not affect the taste of the contents. Glass is impermeable. Glass containers do not absorb odors — and they are easy to wash and sterilize.

Glass containers are economical and can be shaped and moulded into an infinite variety of pleasing forms. In a word, glass containers are an essential part of our way of life — the ideal container.

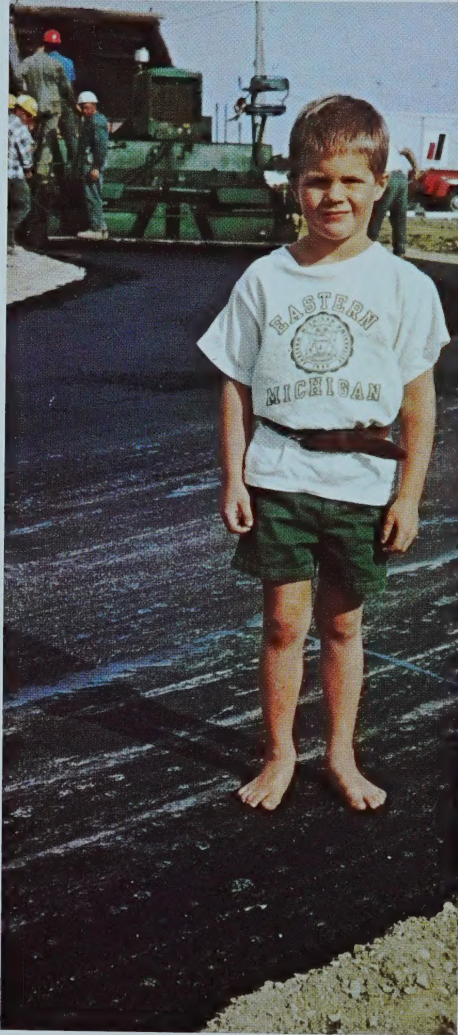
Plastic containers for foods, beverages, cosmetics, toiletries, pharmaceuticals and chemicals are produced at the company's plastics division plant in Etobicoke, Ontario.

Four of the 14 production lines at the Wallaceburg, Ontario, plant specialize in the manufacture of a wide variety of tumblers, tableware and specialty items for the retail and institutional trades. Dominion Glass tumblers, ash trays, salt and pepper shakers and many other items are familiar articles in Canadian homes, restaurants, hotels, bars, lounges and institutions. Specialty items include such things as glass door knobs, fuse plugs, lids and stoppers, globes for light fixtures and electric insulators.





1 - Bottle redemption and recycling depot at the Dominion Glass plant in Montreal, Quebec.



2 - Glasphalt's smooth surface is completely safe for children's feet, tires, etc.

3 - Crushed waste glass — the basic raw material for glasphalt paving. Glass particles are round and smooth — can be handled without gloves.



4 - Paving a street section with glasphalt — Scarden Avenue, Scarborough, Ontario.



Glass containers and the environment

Dominion Glass Company Limited is a founding member of the Glass Container Council of Canada and an active member of the Glass Container Manufacturers Institute. Both associations are involved in seeking practical solutions to the problems of litter and solid waste.

Glass containers account for about five per cent by weight of solid waste and about three per cent by item-count of roadside litter. Dominion Glass fully recognizes and voluntarily assumes a responsibility for helping to resolve these problems.

The following are basic policy commitments which the company has stated publicly on many occasions as part of its active program in meeting this fundamental responsibility.

Solid waste management

Dominion Glass Company Limited is committed to the proposition that the only feasible long range solution to the solid waste problem lies in the salvage and recycling of the many components of refuse. The company holds the conviction that this is the only solution commensurate with the preservation of environmental quality, conservation of natural resources and the efficient management of solid wastes. Implicit in this conviction is our commitment to develop the technology for recycling the maximum volume of used container glass back into the bottle making process or into other products which can be made from waste glass.

These long range objectives can only be attained through government-industry cooperation aimed at the establishment of automated refuse collection systems and segregation centres on a municipal or regional basis, where raw refuse can be separated into its component parts and processed for recycling back into industry.

In line with these objectives the Glass Container Council of Canada and its member companies are contributing financial and technical support to the work of Dr. R. H. Clark and Dr. J. H. Brown of Queen's University toward the establishment of Canada's first total reclamation plant in Kingston, Ontario. This million-dollar prototype plant is a first step in determining and developing the potential value of municipal wastes such as glass, paper, ferrous and non-ferrous metals, food wastes and compost.

Waste glass, besides being used in the production of new glass containers (the use of up to 50 per cent or more 'cullet' in the batch is now considered a reasonable goal), can be used in a number of other recently developed products such as 'glasphalt', glass building bricks, insulating wool and aerated concrete.

Glasphalt

A large potential exists in the use of crushed waste glass as aggregate in glasphalt, a product in which the glass substitutes for crushed limestone in asphalt for paving streets. Estimates indicate that the need for such aggregate in most cities would far exceed the available supply of waste glass. Most municipalities have their own hot batch asphalt plants and would need only to remove the glass from their own refuse for such a use.

The feasibility of this reuse of glass is being thoroughly tested in pilot projects consisting of sections of road paved with glasphalt at the Dominion Glass plant in Bramalea and on a city street in Scarborough, Ontario. We are optimistic that this will prove to be a development of major commercial value.

Because of these developments the glass container industry has reached the conclusion that there are more potential uses for waste glass than there is glass available from refuse now or in the predictable future.

Litter prevention

Dominion Glass Company Limited, as a result of its involvement in litter prevention activities, is firmly dedicated to the concept that effective litter control can only be achieved through a three-point program of public education, enactment and enforcement of effective anti-littering laws, and the provision of adequate means of disposing of litter—trash receptacles, auto litter bags, etc.

Because it is people who litter and not things, we are convinced that a program of massive and continuing public education, starting in kindergarten, coupled with a strong appeal to the individual's sense of responsibility for the quality of our environment will achieve practical results.

For further information on the reclamation and recycling of glass containers please write to the Director of Public Relations, Dominion Glass Company Limited, 1080 Beaver Hall Hill, Montreal 128, Quebec.



PLANTS

	Furnaces (at capacity)	Production lines (at capacity)
Montreal, Quebec 2376 Wellington Street	3	14
Bramalea, Ontario 100 West Drive	2	8
Hamilton, Ontario Chapple Street	3	14
Wallaceburg, Ontario 1250 James Street	4	14*
Redcliff, Alberta 1st Ave & 1st Street N.E.	2	8
Burnaby, B.C. 6850 - 20th Avenue	2	5
Etobicoke, Ontario (Plastics Division) 177 North Queen Street	—	6
National Pressed Glass Limited 47 Morton Avenue East Brantford, Ontario	1	2

* Four of the 14 lines at the Wallaceburg plant are for the manufacture of tableware and specialties.

OFFICES

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District Sales Office
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Etobicoke, Ontario

Regional Sales Office
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District Sales Office
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